

REMARKS

The Office Action dated May 21, 2003 has been received and carefully noted. The above amendments to the specification, drawings and the claims along with the following remarks are submitted as a full and complete response. Figures 1, 3, 7, 9, and 14 are amended. The specification is amended to reflect the amendments to the figures. In addition, Claims 2, 3, and 12-14 are amended. Claims 4-6, and 9-11 are cancelled. No new matter is added. In view of the above amendments and the following remarks, favorable consideration of claims 2, 3, 7, 8, 12-14 is respectfully requested.

The drawings were objected to for having reference numerals designated to multiple elements and failing to designate Figure 1 as Prior Art. Figures 1, 3, 7, 9, and 14 are amended to overcome the objection to the drawings. The specification is also amended to reflect the amendments to the drawings. No new matter is added. In view of these amendments, Applicants request the withdrawal of the objection to the drawings.

Claims 1-3 and 8-10 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kondo et al. (Japanese Patent Application 2000-91883, hereinafter "Kondo"). Applicants respectfully submit that the claimed invention is neither taught nor suggested by the applied reference. It should be noted that claims 1, 9 and 10 are cancelled.

Claim 2 is directed to a surface acoustic wave device having a plurality of interdigital transducers disposed on a surface acoustic wave propagation path of a piezoelectric substrate, and a reflecting electrode disposed at both the sides. The plurality of interdigital transducers contain a first type of interdigital transducer and a second type of interdigital transducer disposed alternately. When an aperture length of an electrode finger of the first type of interdigital transducer is denoted by X, each of the second type of interdigital transducers has two divided interdigital transducers each having an electrode finger in which each aperture length is denoted by substantially X/2.

The first type of interdigital transducer is connected to an unbalanced input or output terminal pair, and the two divided interdigital transducers are serial-connected, and the electrodes of the respective electrode fingers are led from the two divided interdigital transducers, and are connected to a balanced terminal pair, and the respective electrode fingers of the two divided interdigital transducers are disposed so that phases of signals in the balanced terminal pair are different at 180°.

Accordingly, the present invention provides a surface acoustic wave device that provides an unbalanced-balanced transformation function and a function of impedance transformation. Therefore, the present invention results in the advantage of downsizing of the surface acoustic wave device.

It is respectfully submitted that the prior art fails to disclose or suggest at least the element of "when an aperture length of an electrode finger of the first type of interdigital transducer is denoted by X, each of the second type of interdigital transducers has two divided interdigital transducers each having an electrode finger in which each aperture length is denoted substantially by $X/2$ ". The applied reference also fails to teach or suggest a connection part of the two divided interdigital transducers connected to the ground. As a result, the applied reference fails to teach or suggest at least these features of the presently pending claims, and therefore fails to provide the advantages which are provided by the present invention.

Kondo is directed to a surface acoustic wave filter that includes an unbalanced input/output terminal. A first step input and output electrode group and a second step input and output electrode group are also disclosed. In addition, Kondo teaches that the intersection width of the face of the second step electrode group output electrodes are divided into two.

The Examiner refers to Fig. 3 of Kondo (pages 2-3) and equates the intersection width of the face of the second step blind-like electrode group output electrodes 3b and 4b being divided into two to when an aperture length of an electrode finger of the first type of interdigital transducer is denoted by X, each of the second type of interdigital

transducers has two divided interdigital transducers each having an electrode finger in which each aperture length is denoted by substantially X/2. Applicants respectfully disagree with the Examiner's assertion.

First of all, Kondo merely discloses an output-like electrodes being divided into two. In contrast, the present invention recites that the interdigital transducer of the first type is connected to an unbalanced input or output terminal pair. In addition, each of the second type of interdigital transducers has two divided interdigital transducers each having an electrode finger in which each aperture length is denoted by X/2. Kondo, however, fails to even mention reflecting electrodes disposed at both sides of the plurality of interdigital transducers. Furthermore, Kondo fails to teach or suggest a second type of interdigital transducers having two divided interdigital transducers and each interdigital transducer having an electrode finger in which each aperture length is denoted by X/2.

In addition to the limitations discussed above, Kondo fails to disclose or suggest a connection part of the two divided interdigital transducers connected to the ground. This feature provides the benefit of providing an efficient phase difference of signals in the balanced output terminal pairs OUT 1 and OUT 2. It is respectfully submitted that Kondo neither teaches nor suggests this feature and therefore, does not provide the benefits provided by the claimed invention.

In view of the above analysis, Applicants respectfully submit that Kondo neither teaches nor suggests reflecting electrodes disposed at both sides of the plurality of interdigital transducers, wherein each of the second type of interdigital transducers has two divided interdigital transducers each having an electrode finger in which each aperture length is denoted by substantially by X/2. Kondo also fails to teach or suggest that an interdigital transducer of the first type is connected to an unbalanced input or output terminal. Furthermore, Kondo fails to teach or suggest a connection part of the two divided interdigital transducers connected to ground. As a result, Applicants request the withdrawal of the rejection of claim 2 under 35 U.S.C. 102(b).

Claims 3 and 8 are dependent upon claim 2. Therefore, it is respectfully submitted that claims 3 and 8, for at least the reasons mentioned above, also recite subject matter that is neither taught nor suggested by the applied reference. Accordingly, Applicants respectfully request the withdrawal of the rejection of claims 2 and 8 under 35 U.S.C. 102(b).

Claims 1-7, 9 and 10 were rejected under 35 U.S.C. § 102(b) and 102(e) as being anticipated by Baier et al. (U.S. Patent No. 6,353,372, hereinafter "Baier"). The Examiner takes the position that Baier teaches or suggests all the features recited in claims 1-7, 9 and 10. It should be noted that claims 1, 4-6, 9 and 10 are cancelled. Therefore, the rejection of these claims is moot. Applicants respectfully submit that claims 2, 3, and 7 recite subject matter that is neither taught nor suggested by the applied reference.

Baier is directed to a dual-mode surface acoustic wave filter that can be operated balanced or unbalanced and utilizes coupling converters. The filter has interdigital converters for each track which are disposed within reflectors and act as input and output converters. The input/output converters have an impedance determined by splitting the input/output converters into a plurality of individual converters. More specifically, Baier discloses an input converter 100 that is split into converter elements W1 and W2 which are connected in series.

However, Baier does not teach or suggest a plurality of interdigital transducers that contain a first type of interdigital transducer and a second type of interdigital transducer disposed alternatively. In addition, Baier fails to teach or suggest a connection part of the two divided interdigital transducers connected to ground. Therefore, it is submitted that Baier fails to anticipate the features recited in claim 2. Accordingly, Applicants request the withdrawal of the rejection of claim 2 under 35 U.S.C. 102(b) or 102(e).

Claims 3 and 7 are dependent upon claim 2. Therefore, it is respectfully submitted that claims 3 and 7, for at least the reasons mentioned above, also recite

subject matter that is neither taught nor suggested by the applied reference. Accordingly, Applicants respectfully request the withdrawal of the rejection of claims 2 and 8 under 35 U.S.C. 102(b) or 102(e).

Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kondo or Baier in view of Ueda et al. (JP 9-167936 or U.S. Patent No. 6,037,847, hereinafter "Ueda"). The Examiner takes the position that the features recited in claims 13 and 14 are disclosed or suggested in the combination of Kondo or Baier in view of Ueda. The Examiner notes that Kondo and Baier disclose all the features recited in claims 13 and 14 except for disclosing the piezoelectric substrate to be in cuts of LiTaO_3 or LiNbO_3 . The Examiner utilizes Ueda to disclose this feature. Applicants respectfully submit that Ueda fails to cure the deficiencies of Kondo or Baier. It should be noted that claims 13 and 14 are dependent upon claim 2.

Ueda is directed to a surface acoustic wave device that includes a piezoelectric substrate of a single crystal LiTaO_3 and an electrode pattern provided on the piezoelectric substrate. Ueda also discloses that the substrates have various cut angles (36° Y, 40° Y, 42° Y and 44°Y).

It is respectfully submitted that the cited references fails to teach or suggest a connection part of the two divided interdigital transducers connected to ground. The applied references also fails to teach or suggest that each of the second type of interdigital transducers have two divided interdigital transducers each having an electrode finger in which each aperture length is denoted by substantially $X/2$. In addition, the applied references do not teach or suggest an interdigital transducer of the first type being connected to an unbalanced input or output terminal pair. Therefore, it is respectfully submitted that claims 13 and 14, for at least the reasons mentioned above, also recite subject matter that is neither taught nor suggested by the applied reference. Applicants respectfully request the withdrawal of the rejection of claims 13 and 14 under 35 U.S.C. 103(a).

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Claims 4-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kondo in view of Baier. Claims 4-6 are cancelled. Therefore the rejection of claims 4-6 is moot.

Claims 11 and 12 were indicated to contain patentable subject matter if rewritten in independent form. Claim 11 is cancelled. Claim 12 is amended to be in independent form.

In view of the amendments and distinctions discussed above, withdrawal of the rejections to claims 2, 3, 7, 8, 12-14 is respectfully requested. It is respectfully submitted that these claims recite subject matter that is neither taught nor suggested by the applied references. Claims 2, 3, and 12-14 are amended. Figures 1, 3, 7, 9, and 14 are amended. The specification is also amended. No new matter is added. In view of the above amendments and remarks, Applicants submit that the application is now in condition for allowance with claims 2, 3, 7, 8, and 12-14 contained therein.

Should the Examiner believe the application is not in condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, Applicants respectfully petition for an appropriate extension of time. The Commissioner is authorized to charge

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payment for any additional fees which may be required with respect to this paper to
Counsel's Deposit Account 01-2300 referencing Docket No. 108066-00052.

Respectfully submitted,

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Enclosures: Figures 1-3, 7, 9 & 14



FIG. 1 PRIOR ART

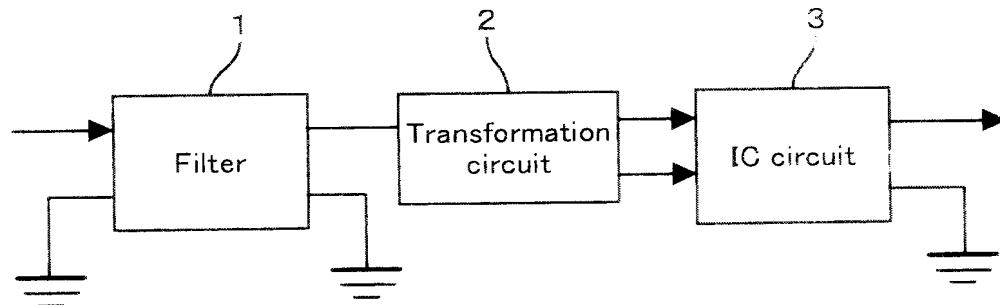


FIG. 2

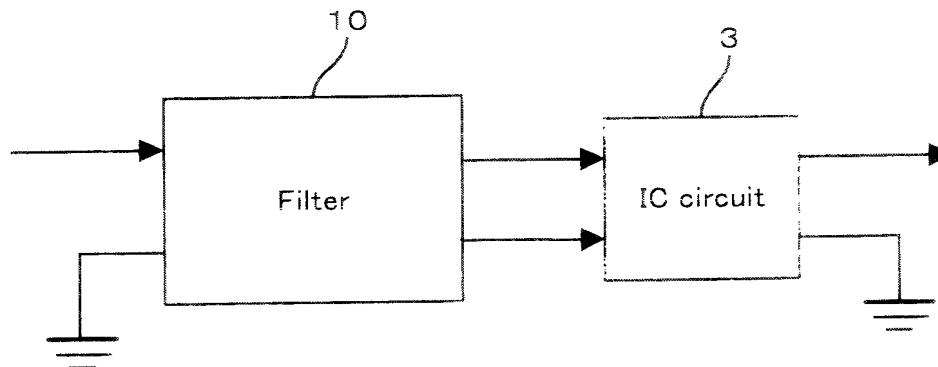
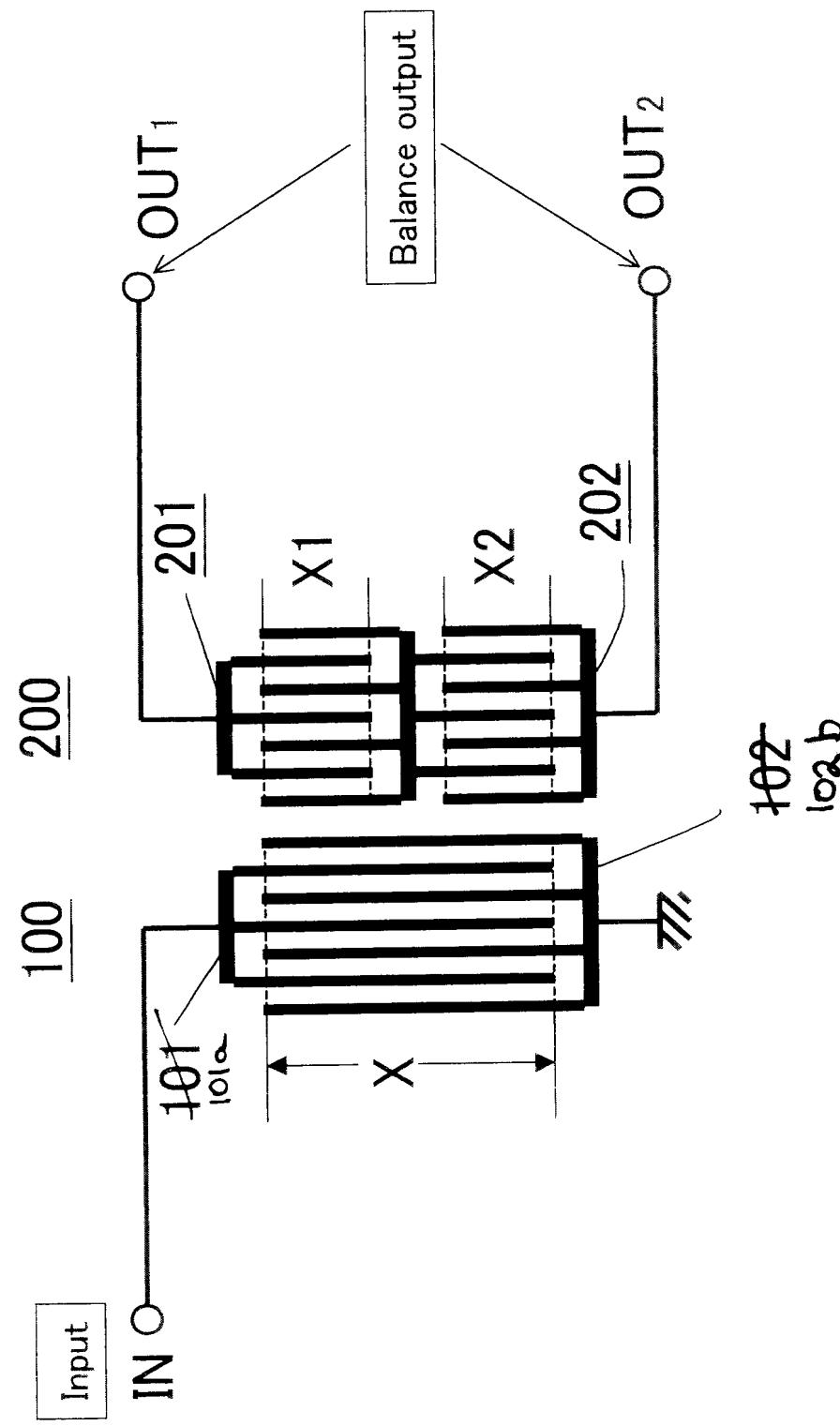




FIG. 3



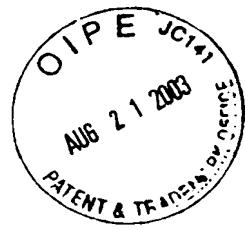


FIG. 7

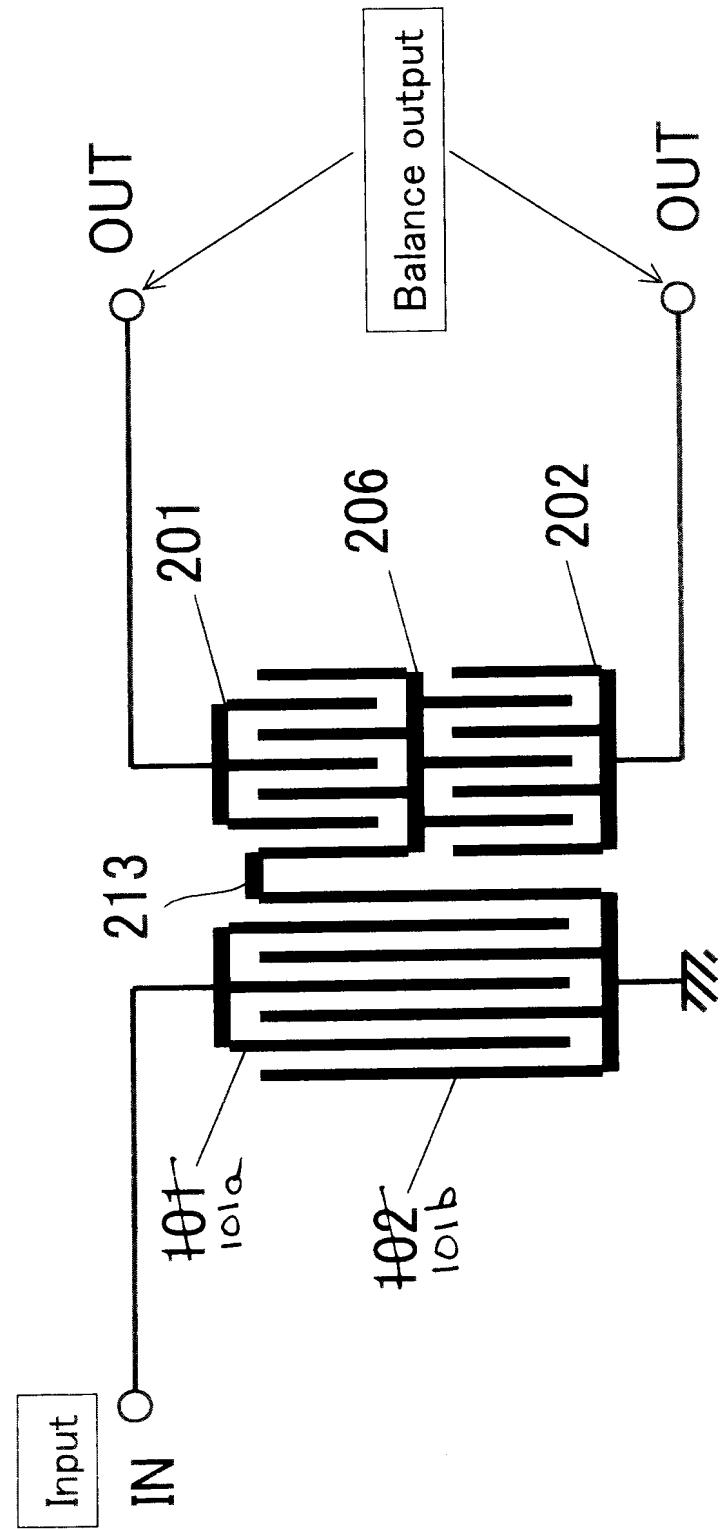
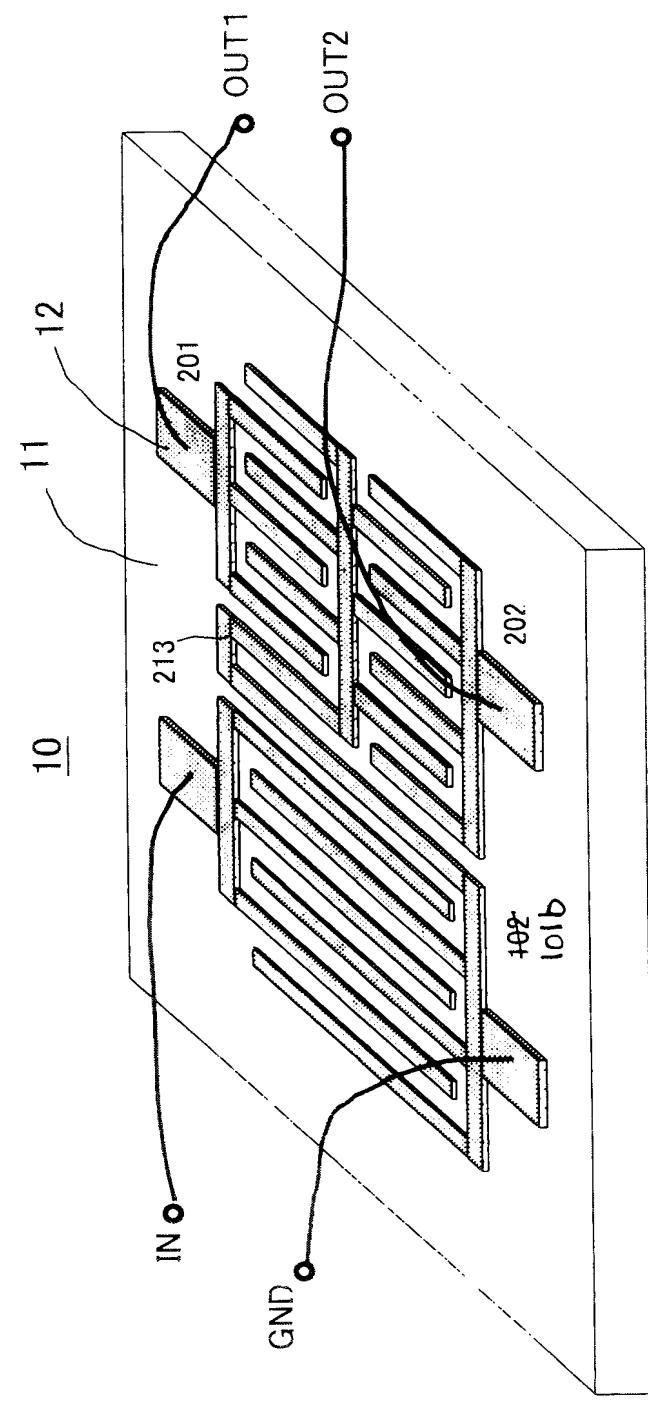




FIG. 9



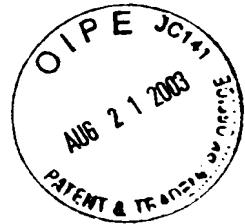


FIG. 14

